

Satellites," by Ellen M. Clerke. We have now before us a second one, entitled "The Planet Venus," in which the authoress lays before us in a pleasant manner a similar summary of the more important points connected with this planet's appearance. Commencing with a few words with regard to the position of Venus with relation to the other planets in the solar system, one is introduced successively to her changes of aspect due to her varying positions in her orbit, to the "silver crown" or halo produced by the refraction of the sun's rays round her globe, and to her rotation, general appearance, and polar caps. Her appearance at times of transit, and the phantom satellite, are then dealt with, the concluding chapter speaking of her in connection with the Star of Bethlehem. In this last reference is made to the "enhanced splendour with which she occasionally—once or twice in a century or so—shines at such times." That the planet does assume this increase of brightness, in addition to that due to her position, seems very doubtful, and the explanation here given to account for it depends on the luminous clouds theory suggested by the lectures on the liquefaction of gases by Prof. Dewar. The monograph is well worth a perusal, and should be widely read.

"MEMOIRE DELLA SOCIETA," &c.—Among the contributions to these memoirs for the month of July will be found a detailed account of the late eclipse of the sun as observed from the Royal Observatory of Catania; a note by Millosevich giving some data with a map for the eclipses of May 28, 1903, and August 30, 1905; and the spectroscopic observations given in graphical form of the sun's limb, made at Palermo and Rome during the months of October, November, and December of 1891.

GEOGRAPHICAL NOTES.

IN the September number of the *Geographical Journal*, Mr. Fred. Jeppé has a paper dealing in great detail with the Zoutpansberg gold-fields in the north of the Transvaal, illustrated by a new map of the district on a large scale, and by several photographs of characteristic scenery. The paper is historical as well as topographical, and contains an interesting account of the ancient workings in the Palabora region. The difficulty of orthography of place-names is referred to, several examples of alternative spelling being given, of which the series Li-Thaba, Lehlaba, Lechlaba, Lethaba, Letaba, Taba is characteristic. The district appears capable of great development when difficulties of transport are overcome by a branch from the Delagoa Bay railway.

DR. R. HANSEN contributes a paper to the last number of *Petermann's Mitteilungen* on the changes in the coastline of south-western Schleswig, with maps showing the coast as it existed in 1240, 1634, and 1892. These maps present a striking picture of the progressive diminution in area of the islands north of the mouth of the river Eider, especially Nordstrand, while those immediately adjoining the river mouth have been united with the mainland, and extended in area by the erection of dykes. As the islands have been inhabited from very early times, and protected to a certain extent by dykes, the process of coast-erosion has not been as continuous and gentle as would naturally be the case, but it has been a succession of artificial catyclasms—if the phrase may be used—brought about by exceptional storms destroying the sea-walls. In the old time each of these catastrophes was recorded amongst the islanders by the name of the patron saint of the day when it occurred.

Petermann's Mitteilungen also publishes a new map of Chitral and the surrounding districts of the Hindukush, by Mr. F. Immanuel, who describes the region in a short article.

MR. H. M. DICKSON spent the month of August on board H.M.S. *Jackal*, on behalf of the Fishery Board for Scotland, in carrying out a series of physical observations on the water between the Orkney, Shetland, and Faeroe Islands. This work was, to a certain extent, in concert with that being done by the Danish and Swedish Governments on the entrance to the Baltic and the neighbouring ports of the North Sea.

MEETING OF THE FRENCH ASSOCIATION.

THE twenty-second meeting of the Association Française pour l'Avancement des Sciences was held this year at Besançon (Département du Doubs), capital of the old province

of Franche Comté. Few towns in France, even although small, are wanting in historic or antiquarian attractions, and in these respects Besançon has much to interest the antiquarian as well as the man of science, and therefore on its own merit is well worthy of a visit. The meeting of the French Association in this town not only enabled many to see it who otherwise would perhaps never have had occasion to do so, but owing to the facilities afforded, both by the municipality and by the civil and military authorities, practically everything interesting in the town and in the environs was liberally put within the reach of the members of the Association.

The meetings of the Association were held in the Lycée, which was built by the Jesuits about the commencement of the seventeenth century, and by reason of the great number of classrooms afforded the necessary facilities for the meetings of the different sections for correspondence, &c.

The Association, although modelled on the lines of the British Association, has a slightly different scope, owing to the conditions which brought it into existence. It really commenced as the "Association Scientifique de France" in 1864, when it was founded by Le Verrier, but this subsequently to 1871 became combined with the Association Française pour l'Avancement des Sciences, the object of which was not only scientific after the mode of the British Association, but also aimed at reviving the study of science and of stimulating scientific research in the departments by bringing French scientific men together in the different principal towns throughout the country, enabling them thus to become better and more practically acquainted with France as a whole, and with the wishes, wants, and requirements of the populations. This patriotic object has been well kept in view, and the cordiality of the reception afforded to the Association wherever it goes shows how well its work is appreciated by the country. It would therefore follow that the study of the district visited forms an important part of the work of the Association, and that the "Excursions" are just as much sought after as in the meetings of the British Association.

The business usually commences with a general meeting, held either in the theatre of the town visited or other public building capable of affording the necessary facilities; in this case it was held in the theatre, a remarkable structure dating back to 1778, and inaugurated in 1784 by the Prince de Condé and his son, the Duc de Bourbon. On the stage facing the house was the table, at which sat the principal authorities of the town, civil and military, the president and principal officers of the Association, and ranged behind them the invited guests, notabilities, and chairmen of sections or committees, &c., evening dress being practically *de rigueur*. The business commenced by the Maire of Besançon reading an address of welcome to the Association, and of hearty sympathy with its objects. Then the president for the year, Dr. Bouchard, Membre de l'Institut and de l'Académie de Médecine, Professeur à la Faculté de Médecine de Paris, read his address, of which the following may be taken as the leading points. Having thanked the town of Pau for the reception given to the Association in 1892, and thanked the Maire of Besançon for the cordiality of his welcome, he defined the double object sought by the French Association's scientific progress, having for ulterior aim the greatness of their country. He paid a well-merited compliment to Besançon for its traditional love of learning and spirit of culture manifested in its celebrated men and scientific institutions. Turning then to the subject proper of his address, he expressed the desire to speak of the scientific movement and the position of scientific men at the present period, and in order to speak with competence he proposed to take his examples from the profession "which he cultivates, teaches, and practises," being justified in doing so by the fact of his having been called on to preside in his quality of a doctor. He then pointed to the wonderful development of scientific study at present, and stated that in the Faculty of Medicine of Paris 1200 students present themselves each year for the degree of M.D. (Doctorat en Médecine); of these 700 soon give up, while 500 persevere and attain their degree.

He pointed out that, whatever the causes, it is manifest that during the past fifteen years the number of students has been on the increase. He then entered on an analysis of the causes of this movement which extend to other branches of science.

"It has been said that the German schoolmaster was the conqueror at Sadowa; it was repeated after more recent disasters. It is false," but the "*mot fit fortune chez nous*," and the

whole of France resolved to accept sacrifices equal in extent to those entailed by the defeat, in order to insure a national recovery. This sentiment dominated at the foundation of the French Association. Schools in every grade have been multiplied, as also new chairs. Their faculties have been created, at least for medicine, but have not given results expected of them. The real object sought was to retain in a certain number of university centres the crowd of students which encumber the Faculty of Medicine of Paris without profit for themselves or for it. "This encumbrance seems not to have diminished at Paris, and our provincial faculties might without harm see their scholastic population trebled." As a matter of fact, the newly created chairs, laboratories, and faculties have in a remarkable manner multiplied sources of employment and created outlets for young men. It is certain that many have commenced working in order to make themselves positions in the teaching world. They have subsequently seriously taken up scientific study and disinterested scientific work. "Young men of science desire, and naturally so, that their work should be immediately remunerated. This is a novelty in our old university." These pretensions are to some extent legitimate, and the budget must provide for them, but the budget is beginning to resist, and the day is approaching when the State will only ask for, and will only accept, the absolutely necessary services, while on the other hand insuring to those who devote themselves to scientific instruction a honourable position and a satisfactory future.

"The public powers must become persuaded that instruction in every degree and in every direction of employment is and must be treated as a career."

As may be seen, we have reached a critical period when the plethora is become excessive, and a situation which has become painful has to be remedied somehow. "The raising of the standard of the position of men of science is one of the spontaneous consequences of progress, at once natural and necessary."

The applications of science carry with them certain advantages; one of these well calculated to entice generous natures, is the degree of esteem accorded to a profession. Certain professions enjoy more favour in given periods than others—military men during the First Empire, lawyers under the Restoration, engineers towards 1848, and under the Second Empire during the period of railway building. The turn of the doctor has perhaps come. "I am inclined to think so when I consider the extraordinary number of doctors who sit in the elected consultative bodies, and the important rôles that they play therein. Dr. Bouchard then cited their influence on Parliamentary legislation in the matters of vaccination, the use of antiseptics, and sanitation. In no way does the parallel progress of scientific dignity and public esteem manifest itself more strongly than in the matter of specialties. Knowledge is no longer encyclopædic. A doctor can no longer become learned but on condition of becoming a specialist. Surgeons have been the first specialists. They have extended to so many objects their fecund activity, and enlarged their domain to such an extent, that surgery, having absorbed everything about it, will soon cease to have a separate existence. It dismembers itself into specialties which multiply day by day. "I see approaching the day when there will be no longer either doctors or surgeons, and when there will exist for those who dedicate themselves to the art of healing a general pathology with general therapeutics, including amongst other things the laws and processes of operative intervention." Starting from this general fund of knowledge, doctors will classify themselves according to the natural groups of maladies to the study and treatment of which they may dedicate themselves. "It will be necessary that the State and the teaching bodies should comprehend, foresee, and provide for this evolution which is certain to be accomplished. It is necessary, above all, that those who dedicate themselves to the medical profession should receive a common and general solid instruction which will enable each one to work out later on, with fruit, his specialisation."

He then cited the position which oculists have attained in the public esteem. They have constituted a science. The art of the oculist has become ophthalmology, "the most brilliant, sure, and, I was about to say, most perfect branch of medicine." He considers in the same way the position attained by the dentist. In changing their titles oculists and dentists wish to mark the

arrival of a new age, the accession of their arts to the real scientific period.

After a few words upon the position of men of science, Dr. Bouchard stated, as showing the wide field still open for modest efforts, that of the 36,000 communes of France 29,000 have no doctor. It is a field opened up for active and devoted work.

But neither ambition nor the satisfaction of worldly requirements, nor even the thirst for self-sacrifice suffice to explain the intensity of the movement which carries along to scientific occupations so many men belonging to the intellectual and moral *élite* of the nation. People go towards science because of its attractions and fascinations. If geometry can excite a very passion, why not the study of physical phenomena, the determination of biological laws? "Medicine has seductions which may raise a smile, but which all those who have dedicated their existence to it understand." To grasp the causes of disease, discern their modes of action, is the question which has been posed since the origin of medicine; it is the problem which for the last 2000 years and more has tormented the greatest intellects of the medical profession. These causes have been revealed to us for a great number of maladies by a man who was not a doctor. This revelation dates from but yesterday, and it is only since yesterday that we have been able to introduce into experimentation this factor up to the present unknown—the morbid cause (*la cause morbifique*). From this day dates the great reform in medicine. The modes of work of the old school were then compared with those of the new. They did what they could, what they would always have been obliged to do. They worked out the natural history of malady. They have seen the dawn of a new day. They have become acquainted with the rôle of the microbe in the universal transformation of matter, whether dead or alive, organic or inorganic, an idea so great and so fecund that each science in particular owes to it a part of its progress, while to it medicine owes its very renewal. Herein we have the true reason of this allurements which carries away so many liberal minds to the study of medicine. He then pointed out the parallel development of the study of septicism, and of the intimate relations of the various organs in their functions, and finished by indicating as the principal directing ideas of contemporary medicine, infection, diathesis, auto-intoxication, useful rôle of the internal secretions, nervous reactions, provoking and impeding healthy actions. He finished with some remarks as to the rôle of the Association—one of its great objects being to produce a scientific decentralisation. This decentralisation has been attained; it is in the minds while waiting to be affirmed by our Institutions. Meanwhile we continue our yearly peregrinations. "*Nous sommes en train de découvrir la France.*"

The address was remarkably well received.

The Secretary of the Association afterwards read a report on the work done during the last season, and the Treasurer rendered an account of the financial state of the Association, showing a balance in its favour of about 800,000 francs; Dr. Bouchard then declared the twenty-second session of their congress opened.

In the evening there was a reception held by the Maire at the Hotel de Ville, which was well attended.

At five o'clock on the same evening the bureaux or staff of officers of the different sections were fixed, and the agendas for the meetings to be held next morning. There were no addresses from the presidents of the sections.

Of the seventeen sections, Nos. 1 and 2 were devoted to Mathematics and Astronomy, 3 and 4 to Civil and Military Engineering, 5 and 7 to Physics and Meteorology, 6 to Chemistry, 8 to Geology and Mineralogy, and 9 to Botany. Section 10 dealt with Zoology and Physiology, 11 with Anthropology, 12 Medical Sciences, and 13 Agriculture. Geography was considered in section 14, Political Economy in 15, Pedagogy in 16, and Hygiene in 17. To all these sections a large number of important communications were made.

EXCURSIONS.

Sunday, August 6, Salins and Source of the Lison River.—Leaving at 6.30 a.m. by special train, Salins, situated about twenty-three miles south-south-west of Besançon, was reached at 7.30 a.m., after running through a hilly country showing the limestone formation of the Jura and fully cultivated. Salins is, as the name indicates, situated in a salt district, and the salt springs have been worked from very early if not prehistoric

times. At present it is very much frequented on account of the medicinal action of the water. The situation is remarkable, being overlooked by bold heights which rise to altitudes of 620m. (Fort Belin) and 599m. (Fort St. André), the town itself being at an altitude of 354m. above the sea-level. The curative effects of the salt waters (the mother-liquors remaining after the separation of the salt) are mainly attributed to their remarkable richness in bromide of potassium 322 c. gr. per kg. of water. The natural salt springs worked contain 27 gr. 5 of chloride of sodium per kg., and yield about 13,000 h.lit. per day at 12° C.; they are also largely used for bathing purposes. The total production in salt of these works is about 6000 tons per annum.

Leaving Salins in carriages, the excursionists followed the road which winds up through the heights, and thus had an occasion of seeing the successive outcrops of the geological formations so characteristic of the district, Trias, Lias and Lower Jurassic, the roadsides affording plenty of fossils at different points. The "Col" having been reached, a high undulating district was attained showing the influence of altitude by the relative lateness of the crops, oats, &c., and their sparseness. The farmhouses also mark the vicinity of the high Jura in their form, high-pitched tiled roofs, massiveness, and overhangings, all evidencing relative comfort and prosperity. Having passed the bridge called the Pont du Diable, from the fantastic head sculptured on the keystone of the principal arch, and from the wildness of the gorge over which the road leads, the excursion reached about 11 a.m. the charming and well-wooded valley, deeply enclosed in bold and picturesque Jurassic escarpments, called Nans sous Ste. Anne. Here an excellent *déjeuner* was served under a tent, and in the afternoon a visit was made to the sources of the Lison, situated in a deep hollow, worn out in the Jurassic beds, and receiving from a certain height a cascade which disappears in one of those caves so common to all limestone formations.

The return to Salins was by a different route to that of the morning, but showing fine vistas, and displaying on all sides careful culture and abundant forest growth, which is mostly communal and worked with great care and skill. Along the road in the morning lay piles of timber showing diameters at the butts of 2 feet and 2½ feet, and lengths of 15 to 20-25 yards. Having visited the salt-works in the town, and seen the evidence of their antiquity in the succession of massive masonry constructions required from time to time for their preservation, dinner was served about seven o'clock in the hotel of the baths, and the party returned to Besançon.

Tuesday, August 8, Montbéliard and Belfort.—Leaving Besançon at 6.15 a.m., with the continued fine and warm weather of this wonderful season, the line ran along the Doubs River through a very picturesque and highly cultivated country. Montbéliard was reached about 7.50, when after a short halt the excursionists proceeded by steam tram to the works of Messrs. Peugeot Bros., at Audincourt. The visitors were divided in two series, A and B; the first were conveyed to the workshops of Valentigney (rolling mills, manufacture of springs and saws), and the workshops of Beaulieu (manufacture of bicycles); the last section, B, was conducted through the workshops of Terre Blanche (tools, hardware in general, coffee-mills, coach factory, electrical force plant, &c.). These works seem very active, well organised, and well in touch with the requirements of their markets, the tools manufactured by the firm having a high reputation for quality and cheapness. Everything indicated care and attention to the wants of the working people, and the general air of comfort and prosperity which was apparent in other parts of the department, and about Besançon, were here equally evident. Montbéliard was reached about twelve o'clock. There is little remarkable in it except a château of the fifteenth and sixteenth century, which now serves as barracks for the troops. The town is largely inhabited by a race of Protestants, descendants of the Anabaptists who sought refuge there from Friseland. There is also a Jewish element in the population, as indeed also at Besançon and Dijon, marked by the synagogue of a conventional style of architecture and the Hebrew inscriptions. Montbéliard is a very pretty busy town as regards manufactures, but the sewage arrangements *laissent à désirer*; this is to a certain degree intelligible from the fact of the town being situated on the canal which joins the Rhône and the Rhine at the junction of the rivers Allaine, Savoureuse, and Lizaine, at an altitude of 322m. As seen on the occasion of the visit, that is, during a season of great drought, there were evidently elements of typhoid fever, whether prevalent or not was not ascertained.

From Montbéliard to Belfort the line ran through a more rolling country than that in the immediate neighbourhood of Besançon. Belfort (pronounced by the French "Bay four") was reached at 2.15 (after an excellent *déjeuner* at Montbéliard, served in the gymnasium). Situated on the frontier, always a fortress of note, and now rendered celebrated by its splendid defence by Colonel Denfert during the campaign of 1870, its historic interest overpowers its other attractions. Special permission had been obtained for the excursionists to visit the château or citadel. This permission was largely taken advantage of by the excursionists, notwithstanding the somewhat abnormal heat of the afternoon sun. Guided by the officers of the Association and by those of the military service, the visitors were first conducted to the site of the splendid colossal lion which graces the western face of the fortress. Designed by Bartoldi, and executed in Vosges sandstone, it harmonises admirably with the lines of the ground and of the fortress structure. Whether the colour adopted is the best artistically is a matter for the sculptor and artists in general, but the lines are very fine, and the attitude of the lion very happy and expressive. The visitors were then conducted to the plateau, or flat roof, which crowns this part of the fortress, from which is discovered a splendid panoramic view of the surrounding country. An officer of the fort very obligingly gave a detailed description of the district surveyed, explained the position of the German army of siege, showed the line now forming the frontier, pointed out the various points of interest in view from the Ballons des Vosges in the north, to the Swiss Jura in the south, with the vast and fertile plain of Alsace lying between these points, here and there dotted with villages in the distance. One could not fail to appreciate the significance of the absence of a natural frontier line at this point, and at once to understand the vastness of the armaments which have to make good the security of a country so bounded.

A visit was then paid to the monument raised to the volunteers who fell during the campaign of 1870, and then a return was made to the principal square, in which the Town Hall is situated; here, at seven o'clock, dinner was served in a splendid hall ornamented with a set of very fine historic paintings illustrating events in the history of the place. A few and deeply felt words of welcome from the Maire, an equally short but expressive speech from the Préfet of the Department, and the dinner ended under the happiest of conditions for the visitors. A municipal band played during the dinner, and gave the members of the Association a *retraite aux flambeaux* to the station, whence Besançon was reached about 11.15 p.m.

Visit of the Citadel of Besançon, August 7.—By special permission the citadel was opened to the members of the Association in the afternoon of this day. The members, taking advantage of it, assembled at the Roman triumphal arch still preserved and known as the Porte Noire. Thence ascends the steep road conducting into the fort, and remembering that it may have been, or rather must have been, used by Caesar when occupying and holding garrison in this city, one could not but feel a greater interest attaching to the various points presented by the guide. The structure of the fort is mainly due to Vauban, but of course is now somewhat out of date, but the position, taken in conjunction with the occupation of the neighbouring heights, is still very strong, and of great military value. From the parapet of the highest part of the fortress a splendid bird's-eye view is had of the town and its surroundings, while the windings of the River Doubs underneath, the variety of the culture clothing the neighbouring hills, the forts quietly looking over all, and the hum of activity ascending the town, rendered the visit highly interesting, despite the abnormal heat and the climb to the lofty point of view. During the reconstruction of the fort by Vauban, he was obliged to demolish the church of Ste. Etienne, badly injured during the siege. The material was not, however, lost, and amongst other usages a tombstone, evidently of a bishop or an abbot of the Middle Ages, was used as a flooring for one of the sentry boxes or videttes which line the parapet or path running round the summit of the fortress. Other remains have been preserved, partly in the fort, and partly in the garden near the Porte Noire, the former site of a Roman theatre.

Final Excursion, August 11 to 13.—An accident, slight in itself but troublesome for the time, prevented me assisting at this excursion, which comprehended the source of the Loue Pontarlier, Neuchâtel, Bienne, Chaux de Fonds, and the Saut du Doubs, that is, an extremely dangerous and picturesque district on the frontier of Switzerland.

J. P. O'REILLY.